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In the Claims:

1. (currently amended) A surface emitting laser, comprising:

an active region, comprising a plurality of quantum wells, formed between first and second mirrors, wherein the gain of each of said quantum wells ~~or groups of quantum wells~~ is optimized to operate quasi-independently at different temperatures such that stimulated emission is dominated by a different quantum well ~~or group of quantum wells~~ at different temperatures.

2. (currently amended) The surface emitting laser of claim 1 wherein thickness of said quantum wells varies from well to well ~~or between groups of wells~~ so that transition energy and therefore gain peak wavelength varies from well to well or between groups of wells.

3. (currently amended) The surface emitting laser of claim 1 wherein material composition of said quantum wells varies from well to well ~~or between groups of wells~~ to provide varying conduction and valence band offsets between the quantum wells and associated barrier layers.

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4. (currently amended) The surface emitting laser of claim 1 wherein said active region further comprises a barrier layer sandwiched between each of said quantum wells, wherein thickness of said barrier layers varies from barrier to barrier ~~or between groups of barriers~~ so that transition energy and therefore gain peak wavelength varies from well to well ~~or between groups of wells~~.

5. (currently amended) The surface emitting laser of claim 1 wherein said active region further comprises a barrier layer sandwiched between each of said quantum wells, wherein material composition of said barrier layers varies from barrier to barrier ~~or between groups of barriers~~ so that transition energy and therefore gain peak wavelength varies from well to well ~~or between groups of wells~~.

6. (currently amended) The surface emitting laser of claim 1 wherein material composition of claim quantum wells varies from well to well ~~or between groups of wells~~ to induce varying levels of strain from quantum well to quantum well ~~or between groups of quantum wells~~ to provide varying conduction and valence band offsets between the quantum wells and associated barrier layers.

7. (original) The surface emitting laser of claim 1 wherein said quantum wells are gain matched such that the fraction of carriers contributing to stimulated emission is substantially constant over temperature.

8. (currently amended) The surface emitting laser of claim 7 wherein thickness of said quantum wells decreases from well to well ~~or between groups of wells~~, such that each well ~~or group of wells~~ operates at roughly the same internal efficiency η_i at different temperatures.

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9. (currently amended) The surface emitting laser of claim 7 wherein said active region further comprises a barrier layer sandwiched between each of said quantum wells, wherein material composition of said barrier layers varies from barrier layer to barrier layer ~~or between groups of barrier layers~~, so that the barrier layer with the greatest band offset provides a majority of gain at a high operating temperature and the barrier layer with lowest band offset provides majority of gain at a low operating temperature.

10. (currently amended) The surface emitting laser of claim 7 wherein material composition of said quantum wells varies from well to well ~~or between groups of wells~~ to provide varying conduction and valence band offsets between the quantum wells and associated barrier layers such that each well ~~or group of wells~~ operates at roughly the same η_i and η at different operating temperatures.

11. (currently amended) The surface emitting laser of claim 7 wherein material composition of said quantum wells varies from well to well ~~or between groups of wells~~ to

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induce varying levels of strain from quantum well to quantum well ~~or between groups of quantum wells~~ such that the quantum with the highest strain provides the majority of gain at a high operating temperature and the quantum well with the lowest strain provides the majority of gain at a low operating temperature.

12. (original) The surface emitting laser of claim 7 wherein a first group of well comprising a first number of wells provides a majority of gain at a high operating temperature and a second group of wells comprising a second number of wells provides a majority of gain at a low operating temperature and wherein the first number of wells is greater than the second number of wells.

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13. (currently amended) The surface emitting laser of claim 7 wherein an optical confinement factor varies from well to well ~~or between groups of wells levels~~ such that the quantum well having the largest optical confinement factor provides a majority of gain at a high operating temperature and the quantum well having the smallest optical confinement factor provides a majority of gain at a low operating temperature.

14. (original) The surface emitting laser of claim 7 wherein said laser further comprises an anode for injecting holes into said active region and wherein the quantum well that supplies a majority of gain at a high operating temperature is closest to said anode and wherein the quantum well that supplies a majority of gain at a low operating temperature is further from said anode.

15. (currently amended) The surface emitting laser of claim 7 wherein a level of non-radiative recombination centers varies from well to well ~~or between groups of wells~~, and wherein the quantum well with the least number of non-radiative recombination centers provides a majority of gain at a high operating temperature and the quantum well with the most non-radiative recombination centers provide a majority of gain at a low operating temperature.

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16. (currently amended) A method for forming ~~a temperature insensitive surface emitting laser~~ an extended temperature range vertical cavity surface emitting laser (VCSEL) comprising the steps of:

forming a first mirror;

forming an active region on ~~a~~ said first mirror,

said active region being configured to provide a substantially constant stimulated emission at a cavity wavelength λ over an extended temperature range without external temperature compensation,

wherein said step of forming said active region comprises forming a plurality of gain separated quantum wells that operate quasi-independently over temperature to provide a dominant portion of said stimulated emission at said cavity wavelength at a predetermined temperature range within said extended temperature range and wherein said quantum wells are gain matched such that the fraction of carriers that contribute to stimulated emission is substantially constant over temperature; and

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forming a second mirror on said active region.

17. (original) The method of claim 16 wherein the step of forming a plurality of gain separated quantum wells comprises forming a plurality of quantum wells having varying thickness.

18. (currently amended) The method of claim 17 wherein the step of forming a plurality of quantum wells having varying thickness comprises varying the thickness of said quantum wells so that each well or ~~group of wells~~ dominates operation of the surface emitting laser over a predetermined temperature range.

19. (original) The method of claim 18 wherein the step of forming a plurality of gain matched quantum wells comprises forming a plurality of quantum wells having varying gain enhancement factor.

20. (original) The method of claim 19 wherein the step of forming a plurality of quantum wells having varying gain enhancement factor comprises varying the gain enhancement factor of said quantum wells so that η is substantially constant over time.

21. (new) An extended temperature range long wavelength vertical cavity surface emitting laser (VCSEL) comprising:

a first mirror;

a second mirror;

an active region formed between said first and second mirrors, said active region being configured to provide a substantially constant stimulated emission at a cavity wavelength λ over an extended temperature range,

said active region comprising

a plurality of gain separated quantum wells each respectively configured to have a predetermined gain peak wavelength offset from said cavity wavelength,

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said plurality of gain separated quantum wells each respectively providing a dominant portion of said stimulated emission at said cavity wavelength at a predetermined temperature range within said extended temperature range such that said VCSEL operates with a substantially constant stimulated emission at said cavity wavelength over said extended temperature range.

22. (new) The VCSEL of claim 21 wherein said quantum wells are gain matched such that the fraction of carriers contributing to stimulated emission is substantially constant over time.

23. (new) The VCSEL of claim 21 wherein said plurality of gain separated quantum wells includes a plurality of quantum wells at each gain peak wavelength.

24. (new) The VCSEL of claim 23 wherein a first group of wells comprising a first number of wells provides a dominant portion of stimulated emission at a high operating temperature, and a second group of wells comprising a second number of wells provides a

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dominant portion of stimulated emission at a low operating temperature, and wherein the first number of wells is greater than the second number of wells.

25. (new) An extended temperature range long wavelength vertical cavity surface emitting laser (VCSEL) comprising:

a first mirror;

a second mirror;

an active region formed between said first and second mirrors, said active region being configured to provide a substantially constant stimulated emission at a cavity wavelength λ over an extended temperature range,

said active region comprising

a first quantum well configured to have a first gain peak wavelength offset from said cavity wavelength, said first gain peak wavelength being a shorter wavelength than said cavity wavelength,

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a second quantum well configured to have a second gain peak wavelength offset from said cavity wavelength, said second gain peak wavelength being shorter than said cavity wavelength and longer than said first gain peak wavelength,

said first and second quantum wells each respectively providing a dominant portion of said stimulated emission at said cavity wavelength at a predetermined temperature range within said extended temperature range such that said VCSEL operates with a substantially constant stimulated emission at said cavity wavelength over said extended temperature range.

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26. (new) The VCSEL of claim 25 wherein said quantum wells are gain matched such that the fraction of carriers contributing to stimulated emission is substantially constant over time.

27. (new) The VCSEL of claim 25 wherein said plurality of gain separated quantum wells includes a plurality of quantum wells at each gain peak wavelength.

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28. (new) The VCSEL of claim 27 wherein a first group of wells comprising a first number of wells provides a dominant portion of stimulated emission at a high operating temperature, and a second group of wells comprising a second number of wells provides a dominant portion of stimulated emission at a low operating temperature, and wherein the first number of wells is greater than the second number of wells.